

# The last word on that uhf test: it works

## FCC ENGINEER'S REPORT SHOWS 25-MILE RECEPTION AS GOOD AS VHF

The word on uhf—it works satisfactorily—was given by an FCC engineer last week.

Jules Deitz, an engineer in the FCC's Office of the Chief Engineer, submitted the latest, and probably the final report on the year-long test of uhf in the New York area. He reported to the Electronic Industries Assn.'s fall meeting in Toronto, Canada. The report was issued simultaneously by the commission in Washington.

The verdict is based on measurements of picture quality at 768 locations, all within 25 miles of the Empire State Building where the seven New York vhf antennas are located, and where the FCC installed the ch. 31 uhf antenna.

Mr. Deitz, who served as coordinator of receiver installations and measurements, reported that the difference between vhf and uhf with indoor antennas for pictures "passable or better" was about 10%.

But, Mr. Deitz added:

"The difference almost disappears completely when outside antennas are employed."

With indoor antennas, 86.9% of the 768 locations received Grades 1, 2 or 3 pictures for ch. 2, 88.3% for ch. 7 and 79.0% for ch. 31. But when outdoor antennas were added at 313 of these sites, the percentages went up: 97.4% for ch. 2, 99.3% for ch. 7 and 97.7% for ch. 31. The outdoor antennas were added to those locations where a Grade 1 or 2 picture was not obtainable.

In evaluating the quality of the pictures, the trained technicians were given this formula: Grade 1, excellent quality; grade 2, fine; grade 3, passable; grade 4, marginal; grade 5, inferior, and grade 6, unusable.

**Thermal Noise** ■ The poor showing of uhf with indoor antennas, Mr. Deitz stated, "was due primarily to thermal noise caused by lower penetration of uhf signals."

The 29-page report, including five pages of text with the remainder consisting of charts and appendices, also made these other conclusions:

- Except for receiver cost there is little difference in installation cost between uhf and vhf—but more time is needed to select the best position for the uhf antenna.

- At most of the locations (226), good vhf and uhf reception was found

through the use of a single double V antenna favoring uhf.

- No differences in color reception were found between vhf and uhf.

- Ghosting differences between vhf and uhf were found to be insignificant enough to be disregarded.

Two recommendations were made to improve uhf reception. One was that better shielding be provided to overcome interference through the intermediate frequency (IF) circuit of the uhf receiver. The other was that uhf sets provide for the use of coaxial cable in the lead-in lines in order to acquire better reception in difficult locations.

The IF interference occurred from a paging service transmitting from the Empire State Bldg. on 43.58 mc. The IF used by the uhf receivers was in the 45 mc area and caused a degradation of the picture quality. This degraded the picture by two steps usually.

The other difficulty arose from "pick-up" from transmission lines and from the connection between the receiver input terminals and the tuner. This resulted in a ghosting effect which was overcome through the use of coaxial cable lead-ins and matching transformers.

**30-Day Trial** ■ The Deitz report is based on the installation of 110 vhf-uhf RCA receivers with 23-inch screens at 768 locations. Each receiver was left at a single location for one month. The installations, made under contract to the FCC by the Jerrold Electronics Corp., Philadelphia, were made with "every reasonable" effort to obtain the best reception of both vhf and uhf. The locations were specified by the U. S. Census Bureau to provide for an adequate random sampling of New York's 10 million residents.

Actually there were supposed to be 4,500 measurements, of which 900 were to be by receiver installation. But these criteria, for one reason or another ("suspicious householders, indifferent landlords, New York City traffic, winter weather. . .") could not be met. Consequently, only 4,000 measurements, including 768 installations were made.

The tests used WCBS-TV on ch. 2, WABC-TV on ch. 7 and WUHF (TV) on ch. 31. The last was turned over to the city last month and is now WNYC-TV (BROADCASTING, Nov. 5).

For the New York test, the uhf receivers were limited to 10 db for noise

(12 db for the color receivers).

The FCC originally thought that it could use householders to check picture quality, but this proved to be a poor idea. Many of the families could not be gotten together for instruction, it was difficult to educate many families in the purposes of the test, receivers were often operated improperly, there was a language barrier in many instances, and many families could not grasp the difference between questions on the program and the picture.

**Color Fast Homes** ■ One of the major difficulties in meeting the schedule for color was found to be in the human failings of the test families. Using only 10 color receivers which required a short loan at each location, the installers found that many families stalled when it came time to move the receiver. Those with color sets never seemed to be at home when the installation crew arrived to remove the set.

The majority of the 768 locations were on Manhattan Island. Within five miles of the Empire State Building there were 316 locations; from 5 to 10 miles there were 289; from 10 to 15 miles, 88; from 15 to 20 miles, 58, and from 20 to 25 miles, 17.

Besides the FCC tests, checks are being made beyond the 25-mile perimeter by the Assn. of Maximum Service Telecasters. This is a group of existing vhf stations using maximum power. The AMST tests include measurements of color reception.

The New York experiment designed to test uhf in what is considered the worst area for reception in the country, was underwritten with a \$2 million appropriation by Congress. FCC officials have reported they are returning \$250,000 to the U. S. Treasury.

## Bell System considers transistor amplifiers

Increasing the bandwidth capabilities of coaxial cable through the use of transistorized amplifiers is being considered by the Bell System, it was reported last week.

H. I. Romnes, president of Western Electric Co., a Bell subsidiary, made mention of this possibility in a talk to the fall meeting of the Electronic Industries Assn. in Toronto.

The use of such amplifiers at close intervals ". . . means greatly increased frequency space for transmitting tele-